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This is a Quarterly informational publication for City of Tempe employees. If you have comments or suggestions please contact the Environmental, Health and Safety Group.

# The Safety Net



## Back Safety

Your backbone is made up of 24 individual bones called vertebrae that are stacked on top of one another. Your vertebrae are separated by soft discs of cartilage that perform as shock absorbers for your vertebrae, and help your back to bend, twist and move around. Most of the support to your spine is maintained by your stomach muscles, as well as the many muscles and ligaments that run up and down the length of your back.

Openings in each vertebra line up to form a long hollow canal. The spinal cord runs through this canal from the base of the brain. Nerves from the spinal cord branch out and leave the spine through the spaces between the vertebrae.

Adding extra weight, by lifting a load, increase the stress on your back, this can often result in a serious injury.

Your back is essential for most the activities you do each day. Walking, running and even sitting require the use of your back. Back injuries are painful and at the very least can put you on the sidelines. Recovery can be long and painful, so prevention is much better than repair.

### Prevention

The simplest way to begin to protect your back is through simple prevention. Here are a few ideas to help you begin a back injury prevention program.

### Exercise

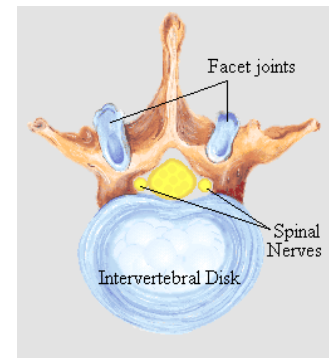
By exercising regularly, you will reduce stress and strengthen your back muscles. Your Doctor is the best source for the types of exercise that will work for you.

### Good Posture

Learning to sit, stand and lift correctly reduces the stress on your back. Do not slouch when you sit and always stand tall.

### Sleep Posture

Make sure your mattress provides good support for your back. If possible, sleep on your side with a pillow under your knees.



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## Performing the PPE Hazard Analysis

**Select PPE only after the first four options in the hierarchy of controls have been evaluated and found to be infeasible. By W. Jon Wallace**

Thousands of people are blinded each year from work-related eye injuries that could have been prevented with the proper selection and use of eye and face protection. Eye injuries alone cost more than \$300 million per year in lost production time, medical expenses, and worker's compensation. (Source: Occupational Safety and Health Administration).

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## Improper Disposal of Hazardous Substances and Resulting Injuries

Selected States, January 2001--March 2005

Many consumer and industrial products, including fuels, solvents, fertilizers, pesticides, paints, and household cleaning disinfectants, contain hazardous substances. Improper disposal of these materials can lead to unexpected releases of toxins that are hazardous to humans and harmful to the environment. This report summarizes all known events involving improper disposal of hazardous substances reported to the Agency for Toxic Substances and Disease Registry (ATSDR) during January 2001--March 2005, describes four illustrative case reports, and provides recommendations for preventing injury resulting from improper disposal.

ATSDR maintains the Hazardous Substances Emergency Events Surveillance (HSEES) system to collect and analyze data about the public health consequences (i.e., morbidity, mortality, and evacuation) of hazardous-substance--release events.\* The information in this report is based on events reported to HSEES from 18 participating state health departments† during January 2001--March 2005.§ Improper disposal events are defined as events in which a hazardous substance is placed in municipal waste and subsequently causes a release or potential release that requires (or would have required) removal, clean-up, or neutralization according to federal, state, or local law.

### Summary of HSEES Data

A total of 36,784 events involving release of hazardous substances were reported to HSEES during January 2001--March 2005. Of these, 107

(0.3%) were associated with improper disposal. All 18 states reported this type of event, with New York (47 [44%] events) and Washington (13 [12%]) reporting the most events. Sixteen (15%) events involved fires or explosions. Of the 159¶ known improper disposal locations, releases occurred most frequently in residential (59 [37%]) and commercial settings (53 [33%]). Of the 284\*\* total substances involved in improper disposal events, the most common substances were hydrochloric acid (24 [8%]), acid not otherwise specified (15 [5%]), and iodine-131 (six [2%]).



Of the 107 events, 35 (33%) resulted in injuries to 69 persons, 64 (93%) of whom were categorized as employees. HSEES does not collect specific information on type of employee injured (e.g., sanitation worker). However, evaluation of the comment field on incidence reports indicated that more than half (39 [57%]) of the 64 injured employees were sanitation workers.

The 69 injured persons had a total of 101 reported injuries, most frequently respiratory irritation (46 [46%]), dizziness or other central nervous system symptoms (12 [12%]), eye irritation (11 [11%]), and burns (nine [9%]). Forty-two (61%) injured persons were treated at hospitals but not admitted, 11 (16%) were treated at the scene, four (6%) were examined by private physicians, three (4%) were treated at hospitals and admitted, and three (4%) were sent to hospitals for observation. The remaining six (9%) persons experienced adverse health effects within 24



hours of exposure; these injuries were reported through official channels (e.g., fire or police departments, emergency

medical services, or poison control centers). No deaths occurred.

Evacuation was ordered for 13 (12%) of the 107 events. The number of evacuees was known for nine of the events, for which 74 persons were known to have evacuated; the number of persons per event ranged from two to 25 (median: six persons per event). The median length of evacuation was 3 hours (range: 1--82 hours). Industry involved in the release, and two (2%) were members of the general public.

### Case Reports

The following case reports illustrate the danger involved in improper disposal of hazardous substances.

**New York.** In June 2004, a sanitation truck compacted an improperly disposed of container of hydrochloric acid, releasing approximately 10 gallons of the hazardous substance into a commercial/residential area. Two male sanitation workers sustained chemical burns and were decontaminated on the scene, treated at a hospital, and released. A hazardous materials (HazMat) team, law enforcement officials, fire department officials, and emergency medical services personnel responded to the event.

**Colorado.** In March 2003, a hospital employee improperly disposed of an unknown quantity of radioactive waste in a dumpster. The dumpster contents were picked up by a garbage truck. Later, as the garbage truck approached the landfill, the contents activated radiation detectors at the landfill. No injuries were reported; however, four first responders were decontaminated at the site. Access to the landfill was restricted until the radioactive waste was removed. A company emergency response team, fire department officials, and hospital personnel responded to the event.

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*Continued from Page 2*

**Washington.** In June 2002, hydrochloric acid used in an illicit methamphetamine laboratory was disposed of in an apartment building dumpster. Later, a male sanitation worker sustained respiratory irritation when the acid was dumped into the back of his truck. After the exposure occurred, his supervisor took the worker to a physician for observation. Law enforcement officials, fire department officials, emergency medical services personnel, and an environmental agency responded to the event.

Of the 97 (91%) events for which decontamination status was known, decontamination of potentially exposed persons was necessary in 31 (32%) events.

Ninety-two persons were decontaminated; of these, 61 (66%) were emergency responders, 29 (32%) were employees (i.e., sanitation workers or employees of the industry involved in the release), and two (2%) were members of the general public.

**Wisconsin.** In August 2001, a sanitation truck compacted an improperly disposed of container of hydrochloric acid, releasing approximately 1 gallon of the hazardous substance into a residential area. The sanitation truck driver sustained chemical burns after coming into contact with the acid. He was transported to a hospital, treated for his injury, and released. A HazMat response team responded to the event.

Reported by: DK Horton, MSPH, S Rossiter, MPH, MF Orr, MS, Div of Health Studies, Agency for Toxic Substances and Disease Registry.

#### Editorial Note:

This report illustrates the dangers associated with improper disposal of hazardous substances. Although improper disposal events accounted for a limited number of hazardous-

substance--release events overall, HSEES has been recording approximately 25 such events per year, and the potential for additional events appears substantial. Persons in the United States generate approximately 1.6 million tons of household hazardous waste each year (2). An average household can accumulate as much as 100 pounds of hazardous waste in basements, garages, and storage closets (2). In addition, industries and businesses in the United States generate more than 40 million tons of hazardous waste annually (3).



Because many hazardous substances are toxic, flammable, corrosive, explosive, or even radioactive, they can be dangerous when disposed of improperly. Of particular concern is the

hazard to sanitation workers because sanitation trucks, especially those with compactors, can easily breach hazardous substance containers, resulting in releases and mixing of substances. During this reporting period, more than half the injured persons were sanitation workers.

At least five of the events were caused by improper disposal of hazardous substances used in illicit methamphetamine laboratories (e.g., hydrochloric acid, ether, and acetone). Substances used in methamphetamine production, many of which are volatile, are often disposed of in municipal waste containers. When these substances are discarded and compacted, the potential for a hazardous release, fire, and explosion is increased.

The majority of the 101 reported injuries examined in this analysis were not life threatening, and no deaths occurred during the reporting period. However, a previous HSEES analysis described the death of a sanitation worker exposed to an improperly disposed of container of hydrofluoric acid (4).

The findings in this report are subject to at least two limitations. Reporting of events to HSEES is not mandatory; therefore, participating state health departments might not be informed about every event. Second, only 18 state health departments provided data to HSEES during the reporting period; therefore, these data underrepresent the total hazardous-substance--release events in the United States.

The findings suggest the need for development and implementation of effective public health strategies to prevent improper disposal practices or injuries resulting from those practices (2,5--7). Such strategies include educating the public regarding proper methods for disposing of hazardous substances, promoting the use of alternative products that do not contain hazardous substances, and organizing community collection days for disposal of hazardous substances (Box).

#### Acknowledgments

The findings in this report are based, in part, on contributions by T Arant, Alabama Dept of Public Health. C Kelley, Colorado Dept of Health. A Becker, PhD, Florida Dept of Health. D Cooper, Iowa Dept of Public Health. K Lanier, Louisiana Dept of Health and Hospitals. M Stanbury, MPH, Michigan Dept of Community Health. N Rice, MPH, Minnesota Dept of Health. R Mozingo, Mississippi State Dept of Health. C Henry, Missouri Dept of Health and Senior Svcs. J Savrin, New Jersey Dept of Health and Senior Svcs. R Wilburn, MPH, New York State Dept of Health. S Giles, MPH, North Carolina Dept of Health and Human Svcs. T Tsongas, PhD, Oregon Public Health Svcs. L Phillips, Rhode Island Dept of Health. R Harris, Texas Dept of Health. W Ball, PhD, Utah Dept of Health. W Clifford, Washington Dept of Health. J Drew, Wisconsin Dept of Health and Family Svcs.

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## Compressed Gas Cylinders



Do you use or store gas cylinders? Did you know OSHA has regulations regarding gas cylinders? Compressed

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*Back Safety – Continued from Page 1*

### **Lifting**

Many back injuries occur because the person thinks the load is light or just simply does not think the lift through. Here are a few simple reminders when lifting a load, no matter how big or small.

#### Plan the Lift

Think about the size and weight of the object you are about to lift. How far will you be carrying it. An item may be light but bulky and hard to handle. Do you need help lifting the object?

#### Position Yourself

Once the lift is planned, position yourself in a lifting position. In front of the load with feet straddling the load and one foot slightly in front of the other. Squat down by bending at your knees; grasp the object with both hands. Do you need help lifting the object?

#### Lift with your Legs

Keep the load close to your body; slowly straighten out your legs until you are standing upright. Make sure the load is not blocking your vision as you begin to walk slowly to your destination. Move your feet around and not by twisting. Do you need help lifting the object? *For more information contact EHS.*

gas cylinders pose numerous hazards including explosions, rapid decompression and atmospheric hazards. A gas cylinder stored improperly could become a deadly projectile.

Cylinders contain various types of gases ranging from flammable, corrosive, reactive or inert. All capable of causing serious injury or death. Inert gases displace oxygen leaving the room or space a silent death trap. Here are a few things to keep in mind.

### **Identification**

All cylinders must be clearly labeled either by stenciling or appropriate label. Cylinders should never be excepted if they are not properly labeled. One common mistake is relying on the color of a cylinder to identify the contents.

### **Storage**

Cylinders must be individually attached to a wall, bench top or placed in a holding cage. Chains or straps that are designed for such use must be used. When provided, bonnets must always be in place when the cylinder is not in use or empty.

If you are not sure if you are in compliance, contact Tempe Fire Prevention or EHS.



## Did You Know...

### **Training Calendar On-line**

<http://www1.tempe.gov/hpcc/eh&s/training%20cal.doc>

Classes are scheduled through April. All courses can be registered for using ThinQ. The course codes are located on the second page of the calendar. If you have a safety topic, or want specific work group training contact EHS.

### **Spill Reporting and Response**

<http://www1.tempe.gov/hpcc/eh&s/chemical%20spills.htm>

If you have hazardous materials at your work site and have an accidental release, would you and other members of your work group know what to do? Visit the intranet site or contact EHS.

### **Hazardous Waste**

<http://www1.tempe.gov/hpcc/eh&s/hazardwastemain.htm>

Because you work for the City, any hazardous waste you generate must be disposed of in accordance with Federal and State regulations. This can include such things as used light bulbs, oil based paint, waste cleaning supplies, pesticides, fertilizers and even certain types of batteries are just some of the items of concern. Visit the intranet site or contact EHS for more information.

### **Flu Information**

<http://www1.tempe.gov/hpcc/eh&s/flu.htm>

It is flu season. Make sure you get the latest and most reliable information on different types of influenza from the Center's for Disease Control (CDC) and the World Health Organization (WHO).

**BOX. Preventing improper disposal of hazardous substances and resulting injuries***General public*

- Learn the proper methods for disposing of hazardous substances.
- Understand the dangers associated with improper disposal of hazardous substances.
- Read container labels for proper use and disposal recommendations.
- Be certain a toxic product is needed before using it.
- Use alternative products that do not contain hazardous substances.
- Purchase the smallest possible quantity of a product.
- Use leftover chemicals for other projects, or share them with other persons (e.g., neighbors).

*Community leaders*

- Place waste containers (e.g., dumpsters) in well-lit, secured areas.
- Train sanitation workers to recognize discarded methamphetamine laboratory chemicals and equipment.
- Establish collection days for hazardous substances.

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- Minnesota Pollution Control Agency. Household hazardous waste disposal. St. Paul, MN: Minnesota Pollution Control Agency; 1993. Available at <http://www.moea.state.mn.us/hhw/w-hhw2-02.pdf>.
- CDC. Acute public health consequences from illicit methamphetamine laboratories---selected states, January 2000--June 2004. *MMWR* 2005;54:356--9.
- Ruckart PZ, Orr MF, Kaye WE. Hazardous-chemical releases in the home. *J Environ Health* 2004;67:14--9.

\* An HSEES event is the acute release or threatened release of a hazardous substance into the environment in an amount that requires (or would have required) removal, cleanup, or neutralization according to federal, state, or local law (1). A hazardous substance is one that can reasonably be expected to cause an adverse health effect upon exposure.

† Alabama, Colorado, Florida, Iowa, Louisiana, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New York, North Carolina, Oregon, Rhode Island, Texas, Utah, Washington, and Wisconsin.

§ Data through March 31, 2005, were the most recent available when the analysis was conducted; data for 2004 and 2005 are provisional.

¶ Exceeds the number of events because some events may occur in mixed-use locations (e.g., in a residential and commercial area).

\*\* Exceeds the number of events because certain events involved multiple substances.

*From CDC MMWR*

## Ready for Jail

Did you know that the statement “**I did not know**” is not a defense during an ADOSH inspection. There are over 1,000 pages in 29 CFR 1910, OSHA Standards General Industry (OSHA Training Institute Manual). How can you possibly know every standard that applies to you? You can't.

OSHA laws place the responsibility of complying with safety regulations on the employer. Who is the employer, or designated jailee, typically the CEO, the manager.

However, the responsibility and often time cellmate may be the Supervisor, Lead Person or the individual just overseeing the work.

In other words, **you** may not only be the employee but may be the employer. Confused, don't be if you have a concern or want a safety assessment performed, please contact the EH&S Group and let us help you.

*Continued from Page 3*

### References

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**PPE Assessment – Continued from Page 1**

Failure to adequately assess the workplace for potential hazards and identify appropriate personal protective equipment (PPE) not only results in thousands of eye injuries each year; it is also responsible for numerous injuries to the hands and arms, torso, feet, and head.

**PPE Hazard Assessment**

To ensure employees wear appropriate PPE for their work tasks, OSHA's 29 CFR 1910.132 (d)(1) requires that employers perform a PPE assessment to

determine whether hazards are present, or likely to be present, that necessitate the use of personal protective equipment. In addition, 29 CFR 1910.132 (d)(2) requires a written certification of the assessment.

**Hierarchy of Controls**

A systematic review of each work task is needed to identify potential hazards. Prior to requiring employees to wear PPE, however, the hierarchy of controls should be utilized to eliminate or reduce the existing hazard(s) to avoid the need for PPE. The hierarchy of controls states that hazards should be controlled in this preference:

1. Elimination
2. Substitution
3. Engineering Controls
4. Administrative Controls
5. Personal Protective Equipment

PPE should be selected only after the first four options have been evaluated and found to be infeasible.

**Personal Protective Equipment for Various Exposures**

Once the hazard assessment is complete, appropriate PPE must be selected. Listed *below* is a summary of typical PPE for various work tasks based upon National Safety Council, OSHA, and ANSI requirements and recommendations.

**Who Pays for PPE?**

During training classes, I am routinely asked whether OSHA requires employers to pay for employee PPE. In an OSHA letter of Interpretation dated August 25, 2004, addressed to Brad Milleson of the Kellogg Company, OSHA states the following: "29 CFR 1910.132 requires employers to provide PPE and ensure its use."

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Work Task	Typical Personal Protective Equipment	Work Task	Typical Personal Protective Equipment
Wire brush wheels	Safety glasses with side shields or impact goggles	Cold weather	Hard hat liners
Grinding stones	Faceshield with either safety glasses and side shields or impact goggles	Close quarters work	Hard hats
Metalworking machines	Safety glasses with side shields or impact goggles, barrier creams	Falling objects	Hard hats
Compressed air	Impact goggles or safety glasses with side shields	Sparks, hot metals	Flame-resistant caps, aprons, hoods, Nomex® canvas spats
Woodworking machines	Abdominal guard or anti-kickback apron, impact goggles or safety glasses with side shields	Long hair protection	Cool lightweight cap with long visor (hair under cap), and hair nets
Handling wood, metal, glass, etc.	Kevlar, leather gloves, or hand pads	Acids, alkalis, etc.--splash hazard	<i>Large quantities:</i> Acid suits, hoods. <i>Small quantities:</i> Faceshield and splash-proof goggles
Landscaping tools	Safety glasses with side shields	Limited direct splash from acids, alkalis, etc.	Faceshield and chemical goggles
Maintenance	Breast pockets sewn closed or removed, tool belt with tools on side, gloves, safety harness and lanyard, impact goggles, or safety glasses with side shields	Working on energized electrical conductors ≥ 50 volts	Flame-retardant clothing and voltage-rated tools and gloves, based upon NFPA 70E flash hazard analysis and OSHA 1910.335 requirements
Material handling	Gloves, hard hat, eye protection	Chain saws	Chaps, eye protection, hearing protection, hard hats



During a confined space audit of McClintock Pool, it was determined that a pump pit for the pool was a Permit Required Confined Space. The audit performed by EHS addressed the specific hazards of the space, which included engulfment, lockout/tagout and entry/exit concerns. The classification made it difficult and next to impossible for pool maintenance staff to perform routine maintenance.

### Solution

Mike Armfield, Mark Richwine and Dan Pitt developed an action plan and presented it to the Program Administrator, Scott Mosley. Their solution involved repositioning existing valves, moving chemical feed lines, developing written electrical lockout procedures and installing stairs.

The solution resulted in the space being reclassified as a Non-Permit Confined Space. The efforts and ingenuity of staff members saved the City monetarily and increased the overall safety of employees assigned to this work group.



A confined space is any space that has a limited means of entry or exit, can be entered to perform any type of work and is not designed for continuous occupancy.

Most injuries and deaths that occur in a confined space are attributed to atmospheric conditions that cannot be seen or detected by the human nose.

### PPE Assessment – Continued from Page 7

However, at the present time, OSHA does not view this section as imposing an enforceable obligation on employers to pay for PPE.

Therefore, employees must be afforded the protection of PPE, regardless of who pays."

OSHA has initiated rulemaking proceedings to clarify who is required to pay for required PPE.

It is important to note that there are numerous OSHA standards that specifically require the employer to provide PPE at no cost to the employee.

Those standards include: Occupational Noise Exposure (1910.95); Respiratory Protection (1910.134); Permit-Required Confined Spaces (1910.146); Fire Brigades (1910.156); Logging Operations (1910.266); Asbestos (1910.1001); Inorganic Arsenic (1910.1018); Lead (1910.1025); Cadmium (1910.1027); Benzene (1910.1028); Bloodborne Pathogens (1910.1030); 1,2-dibromo-3-chloropropane (1910.1044); Acrylonitrile (1910.1045);

Ethylene Oxide (1910.1047); Formaldehyde (1910.1048); Methylenedianiline (1910.1050); 1,3-Butadiene (1910.1051); and Methylene Chloride (1910.1052).

### Apparel Policy

An apparel policy should be included in the PPE procedure. Loose clothing should be prohibited around rotating equipment, and long hair should be tucked under the collar or secured with a hair net. Rings, necklaces, and gloves should not be worn while working around rotating equipment because they may become entangled in the equipment.

### Summary

Used properly, PPE provides a significant increase in protection for

employees. The key components include a documented hazard assessment, employee training as well as periodic inspections to verify program effectiveness.

### This article appeared in the December 2005 issue of Occupational Health & Safety.

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## What Does This Sign Mean?



You better have completed a JHA and trained employees!

## Come Across This...

Here are some simple rules to follow if you encounter a situation like the one pictured here.

- Call for Help!
- Do not move or touch!
- Stay upwind and uphill.
- Protect yourself

Always remember if you or the public is in danger call **911**. EHS will identify the material, perform the clean up and coordinate the transportation of the material. For more information, contact EHS



### General Duty Clause (SEC. 5. Duties)

#### (a) Each employer

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.

#### (b) Each employee

shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

*While there may not be an OSHA standard for what you do, the above is often used by OSHA/ADOSH when a safety situation is encountered. If you are not sure, ask us.*

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<http://www1.tempe.gov/hpcc>